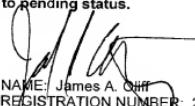


(1390 REV. 5-93) US DEPT. OF COMMERCE PATENT & TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 110071
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (if known, sec 37 C.F.R.1.5)
		09/869883
INTERNATIONAL APPLICATION NO. PCT/JP00/03418	INTERNATIONAL FILING DATE May 26, 2000	PRIORITY DATE CLAIMED November 13, 1999
TITLE OF INVENTION VEHICLE TO ASSIST WALKING		
APPLICANTS FOR DO/EO/US Hiroko SHIKINAMI, Shigeru ONISHI		
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). - <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). 		
<p>Items 11. to 16. below concern other document(s) or information included:</p> <ol style="list-style-type: none"> <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> Entitlement to small entity status is hereby asserted. <input type="checkbox"/> Other items or information: 		

U.S. APPLICATION NO. (if known, see 37 C.F.R. 1.16)		INTERNATIONAL APPLICATION NO. PCT/JP00/03418	ATTORNEY'S DOCKET NUMBER 110071
17. <input checked="" type="checkbox"/> The following fees are submitted:		CALCULATIONS	PTO USE ONLY
Basic National fee (37 CFR 1.492(a)(1)-(5)):			
Search Report has been prepared by the EPO or JPO \$860.00			
International preliminary examination fee paid to USPTO (37 CFR 1.482) \$690.00			
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$710.00			
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1,000.00			
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$ 100.00			
ENTER APPROPRIATE BASIC FEE AMOUNT =			
\$860.00			
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).			
\$			
Claims	Number Filed	Number Extra	Rate
Total Claims	9 - 20 =	0	X \$ 80.00
Independent Claims	2 - 3 =	0	X \$ 80.00
Multiple dependent claim(s)(if applicable)		+ \$270.00	
TOTAL OF ABOVE CALCULATIONS =			
\$860.00			
Reduction by 1/2 for filing by small entity, if applicable.			
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SUBTOTAL =			
\$860.00			
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 month from the earliest claimed priority date (37 CFR 1.492(f)).			
+			
TOTAL NATIONAL FEE =			
\$860.00			
		Amount to be refunded	\$
		Charged	\$
a. <input checked="" type="checkbox"/>	Check No. <u>120776</u> in the amount of <u>\$860.00</u> to cover the above fees is enclosed.		
b. <input type="checkbox"/>	Please charge my Deposit Account No. _____ in the amount of \$_____ to cover the above fees. A duplicate copy of this sheet is enclosed.		
c. <input checked="" type="checkbox"/>	The Director is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. <u>15-0461</u> . A duplicate copy of this sheet is enclosed.		
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.			
SEND ALL CORRESPONDENCE TO: OLIFF & BERRIDGE, PLC P.O. Box 19928 Alexandria, Virginia 22320			
 NAME: James A. Oliff REGISTRATION NUMBER: 27,075			
Date: <u>July 10, 2001</u> NAME: Joel S. Armstrong REGISTRATION NUMBER: 36,430			

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- 1 -

DESCRIPTION

VEHICLE TO ASSIST WALKING

Technical Field

5 The invention relates to a vehicle to assist walking having a function to help a person walk, and a function to help move a person.

Background Art

10 A vehicle to assist walking for assisting a person with disabled legs to walk is known. Such a vehicle to assist walking is disclosed for example in Japanese Unexamined Patent Publication No.6-39007. The vehicle to assist walking disclosed in this publication comprises an upper frame which extends rearwards from the front side of the user to the lateral sides thereof, a lower frame which extends rearwards from the front side of the user to the lateral sides thereof, and connecting frames which connect the upper and lower frames. Front wheels are mounted on the lower frame at the front area thereof, and rear wheels are mounted on the upper frame at the rear area thereof. The user can stand within a space surrounded by the upper and lower frames and walk while user's body is supported by the upper frame.

15 The user uses such a vehicle to assist walking to move to a destination or for rehabilitation. During walking, the user may become exhausted and thus need to take a rest without using the user's legs even if the user uses the vehicle to assist walking since the user's legs are disabled. In this case, in consideration of the relief of the user during walking, it is preferable to be able to rest on the vehicle to assist walking. In the vehicle to assist walking disclosed in the above mentioned publication, however, the user cannot rest without using the user's legs.

20 Further, it is preferable to use the vehicle to assist walking as a support for the body of the user when

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the user has arrived at a destination using the vehicle to assist walking. That is, it is preferable that the vehicle to assist walking can be used as a support for the body of the user in addition to being used as a walking assistant. For example, it is very convenient for the user to use the vehicle to assist walking to move to a restroom, and to use the vehicle to assist walking as a support for the body of the user when the user arrives at a restroom.

In view of these situations, a first object of the invention is to allow the user to rest without using the user's legs when the user becomes exhausted when the user uses the vehicle to assist walking. Further, a second object of the invention is to allow the user to use the vehicle to assist walking as a support for the body of the user when the user arrives at a restroom.

Disclosure of Invention

To accomplish the first object, in the first invention, there is provided a vehicle to assist walking having functions to help a person walk, and for a helper to move a person, wherein the vehicle comprises a frame extending around the body of the user of the vehicle to support the body of the user when the user walks using the vehicle, wheels mounted on the frame, and a seat plate which can project from around the lateral side of the user to an area where the legs of the walking user move, and wherein the seat plate is removed from the area where the legs of the walking user move when the user walks using the vehicle.

In the second invention according to the first invention, the seat plate can be pivoted about a predetermined axis, and the seat plate is projected to the area where the legs of the walking user move by pivoting the seat plate.

In the third invention according to the second invention, the predetermined axis is a horizontal axis.

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In the fourth invention according to the first invention, the seat plate comprises a pair of seat plate portions, and the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move.

In the fifth invention according to the first invention, the seat plate can project from around the lateral and rear side of the user to the area where the legs of the walking user move.

In the sixth invention according to the first invention, the level of the lowest portion of the frame which is located in front of the user is higher than that of a seat of a stool, and the width between the portions of the frame which is located around the lateral and front side of the user is larger than that of the stool.

In the seventh invention according to the sixth invention, the seat plate comprises a pair of seat plate portions, and the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move, and the level of the seat plate portions is higher than that of the seat of the stool and the seat plate portions form a space therebetween when the seat plate portions project to the area where the legs of the walking user move.

To accomplish the second object, in the eighth invention, there is provided a vehicle to assist walking for assisting a person to walk, comprising a frame extending around the body of the user of the vehicle to support the body of the user when the user walks using the vehicle, and wheels mounted on the frame, and wherein the level of the lowest portion of the frame which is located in front of the user is higher than that of a seat of a stool, and wherein the width between the portions of the frame which is located around the lateral and front side of the user is larger than that of the stool.

In the ninth invention according to the eighth

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invention, the seat plate comprises a pair of seat plate portions, and the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move, and the level of the seat plate portions is higher than that of the seat of the stool and the seat plate portions form a space therebetween when the seat plate portions project to the area where the legs of the walking user move.

10 Brief Description of Drawings

Fig.1 is a side view of an embodiment of the invention;

Fig.2 is a front view of the embodiment shown in Fig.1;

15 Fig.3 is a plan view of a seat plate of the embodiment shown in Fig.1;

Fig.4 is a plan view, similar to Fig.3, of a seat plate of a second embodiment;

20 Fig.5 is a plan view, similar to Fig.3, of a seat plate of a third embodiment;

Fig.6 is a plan view, similar to Fig.3, of a seat plate of a fourth embodiment;

Fig.7 is a plan view, similar to Fig.3, of a seat plate of a fifth embodiment;

25 Fig.8 is a plan view, similar to Fig.3, of a seat plate of a sixth embodiment;

Fig.9 is a plan view, similar to Fig.3, of a seat plate of a seventh embodiment;

30 Fig.10 is a plan view, similar to Fig.3, of a seat plate of an eighth embodiment;

Fig.11 is a plan view, similar to Fig.3, of a seat plate of a ninth embodiment;

Fig.12 is a back view of a handle formed in a different manner from a handle shown in Fig.1.

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Best Mode for Carrying Out the Invention

In the below, the invention will be explained in

detail with reference to embodiments shown in the drawings. Fig.1 shows a side view of an embodiment of a vehicle to assist walking of the invention, and Fig.2 shows a front view of the embodiment shown in Fig.1.

5 Note that, below, for the sake of convenience in the explanation, the right side in Fig.1 is referred to as "front", the left side in Fig.1 is referred to as "rear", the upper side in Fig.1 is referred to as "upper", the lower side in Fig.1 is referred to as "lower", and the
10 left and right sides in Fig.2 are referred to as "lateral". Further, in Fig.2, the term "upper" refers to the upper side, and the term "lower" refers to the lower side.

15 As shown in Fig.1, the vehicle of the embodiment comprises a frame 1 which extends to surround the user. The frame 1 has an upper frame 2, a lower frame 3, and connecting frames 4 for connecting the upper and lower frames 2 and 3.

20 The upper frame 2 is generally U-shaped and extends from the front area of the vehicle toward the lateral rear sides thereof. The upper frame 2 is constituted from a hollow pipe having a rectangular cross section. Of course, the upper frame 2 may have any cross section, for example, a circular cross section other than the
25 rectangular cross section. Elastic cushions 5 are mounted around a front portion 2f of the upper frame 2, and portions 2s (hereinafter referred to as upper frame lateral portions) which both extend in a longitudinal direction. Further, handles 6 are removably mounted on
30 the rearmost portions of the upper frame lateral portions 2s. Although the shown handles 6 extend vertically upwards, the handles 6 may be provided extending toward any direction other than the vertical upward direction if necessary.

35 On the other hand, the lower frame 3 is generally U-shaped and extends from the front area of the vehicle toward the lateral rear sides thereof, similar to the

upper frame 2, but the rear portions thereof are bent downwards and extend vertically downwards. In the following explanation, the portion which is horizontal relative to a surface of a floor and extends from the front area of the vehicle toward the lateral rear sides thereof is referred to as lower frame horizontal portion 3h, and the portion which extends vertically downwards is referred to as lower frame vertical portion 3v. Wheels 7, called free casters (hereinafter referred to as rear wheels), which can freely change their moving directions to any direction, are mounted on the lower ends of the lower frame vertical portions 3v. Further, means 8 for fixing the moving direction of the rear wheels 7, if necessary, is mounted on the lower ends of the lower frame vertical portions 3v. The moving direction fixing means 8 is a frame member having U-shape and mounted on the lower portions of the lower frame vertical portions 3v so that the member can rotate about a predetermined horizontal axis Ah. When the member 8 rotates downwards, the rear wheel 7 is introduced into the member 8, and thus the moving direction of the rear wheel 7 is fixed, for example, at the longitudinal direction. The lower frame 3 is constituted from a hollow pipe having a circular cross section, but may be constituted from a hollow pipe having any cross section, for example, oval cross section other than the circular cross section.

The connecting frames 4 have upper portions (hereinafter referred to as connecting frame upper portions) 4u and lower portions (hereinafter referred to as connecting frame lower portions) 4l. Each of these portions 4u and 4l is constituted from a hollow pipe having a circular cross section, but may be constituted from a hollow pipe having any cross section, for example, oval cross section other than the circular cross section. The upper ends of the connecting frame upper portions 4u are connected to generally central portions of the upper frame lateral portions 2s, and the connecting frame upper

portions 4u extend downwards from the central portions of the upper frame lateral portions 2s where the upper ends of the connecting frame upper portions 4u is connected. The outer diameter of the connecting frame upper portion 4u is smaller than the inner diameter of the connecting frame lower portion 4l, and thus the lower end of the connecting frame upper portion 4u is inserted into the connecting frame lower portion 4l. As explained below in detail, the connecting frame upper portions 4u are 10 slidably mounted on the connecting frame lower portions 4l.

The connecting frame lower portions 4l extend vertically downwards from its upper ends, and are bent horizontally forwards near the surface of the floor. In 15 the following explanation, the portions of the connecting frame lower portions 4l which extend vertically downwards are referred to as vertical portions 4lv, and the portions which extend horizontally forwards are referred to as horizontal portions 4lh. Wheels 9, called free 20 casters (hereinafter referred to as front wheels), which can freely change their moving directions to any direction, are mounted on the lower frontmost portions of the connecting frames 4 (that is, the frontmost portions 25 of the horizontal portions 4lh of the connecting frame lower portions 4l).

Screw type fasteners 10 are provided around the upper ends of the connecting frame lower portions 4l. When the fastener 10 is rotated and released, the connecting frame upper portion 4u can be slid relative to the connecting frame lower portion 4l. On the other hand, when the fastener 10 is rotated and tightened, the connecting frame upper portion 4u is fastened relative to the connecting frame lower portion 4l by the end of the screw of the fastener 10. In this way, the connecting 30 frame upper portion 4u is positioned at a desired position relative to the connecting frame lower portion 35 4l, and thus the upper frame 2 is positioned at a desired

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level from the floor.

The generally central portions of the lower frame horizontal portions 3h are connected to the vertical portions 4lv of the connecting frame lower portions 4l. Therefore, the upper and lower frames 2 and 3 are connected by the connecting frames 4.

As the portion where the lower and connecting frames 3 and 4 are connected is referred to as frame connecting portion, a pair of left and right seat plate portions 11p is mounted on the lower frame horizontal portions 3h at the rear side of the frame connecting portions. Each seat plate portion 11p is mounted on the lower frame horizontal portion 3h so that the seat plate portion 11p can pivot about the horizontal axis extending in the longitudinal direction. Each seat plate portion 11p can pivot between a state where the seat plate portion extends vertically upwards (hereinafter referred to as vertical state) and a state where the seat plate portion extends horizontally inwards (hereinafter referred to as horizontal state), and can be positioned and fixed in the vertical or horizontal state. As shown in Fig.3, when the pair of the seat plate portions 11p is positioned and fixed in the horizontal state, a seat plate 11 of the vehicle is constituted by the seat plate portions 11p. Note that the selection of the vertical or horizontal state will be explained in detail below. Further, to allow easy understanding of the seat plate portions, in Fig.3, only the seat plate portions and the lower frame where the seat plate portions are connected are shown.

A pair of left and right foot plates 12 is mounted on the front and lower portions of the connecting frames 4, that is, on the horizontal portion 4lh of the connecting frame lower portion 4l. Each foot plate 12 is mounted on the horizontal portion 4lh of the connecting frame lower portion 4l so that the foot plate can pivot about the horizontal axis extending in the longitudinal direction. Each foot plate 12 can pivot between a state

where the foot plate extends vertically upwards
(hereinafter referred to as vertical state) and a state
where the foot plate extends horizontally inwards
(hereinafter referred to as horizontal state), and can be
5 positioned and fixed in the vertical or horizontal state.
The selection of the vertical or horizontal state will be
explained in detail below.

The vehicle of the embodiment comprises means 13 for
braking the movement of the vehicle. The braking means
10 comprises a frame (hereinafter referred to as U-shaped
frame) 13u having generally U-shape and extending from
the front area of the vehicle to the lateral rear sides
thereof, a pair of left and right bars (hereinafter
referred to as vertical bars) 13v each connected to the
15 generally central portion of the lateral portion of the
U-shaped frame and extending vertically downwards,
members 18g for slidably housing the vertical bars 13v
and guiding the slide movement of the vertical bars 13v,
and members (hereinafter referred to as grounding
20 members) 13m each connected to the lower end of the
vertical bar 13v. The rearmost portions of the U-shaped
frame 13u are pivotably mounted on the lateral portions
of the lower frame horizontal portions 3h. Further, the
front portion of the U-shaped frame 13u is connected to
25 the front portion of the lower frame horizontal portion
3h via biasing means such as a coil spring 14. In
addition, an engagement plate 15 is mounted on the front
portion of the lower frame horizontal portion 3h, which
plate 15 engages the front portion of the U-shaped frame
30 13u to maintain the U-shaped frame 13u at an upper
position.

When the front portion of the U-shaped frame 13u is
engaged with the engagement plate 15 against the biasing
35 force of the spring 14, the grounding members 13m are
maintained at a position raised upwards from the surface
G of the floor. When the upper end of the engagement
plate 15 is withdrawn rearwards, and thus is bent, the

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front portion of the U-shaped frame 13u is released from the engagement plate 15, and thus the U-shaped frame 13u is withdrawn downwards by the biasing force of the spring 14, and then the vertical bars 13v are guided by the 5 guide means 13g and move downwards, and then the grounding members 13m contact the surface G of the floor. In this way, the vehicle is braked. According to this, the performance of braking the vehicle is high since the vehicle is braked simultaneously at both sides thereof.

10 Further, the braking means of this embodiment does not exert a braking force directly to the front and rear wheels 9 and 7, so the vehicle can be braked using the braking means having relatively simple mechanism of the invention even if free casters are used as the front and 15 rear wheels 9 and 7. That is, a mechanism more complicated than that of the braking means of the invention is necessary to exert the braking force directly to the free casters, but according to the invention, the vehicle can be braked by a relatively 20 simple mechanism.

Advantages of the above explained vehicle will be explained in the below.

In the above explained vehicle, a person (hereinafter referred to as user) using the vehicle can stand within a space surrounded by the upper, lower and connecting frames 2, 3 and 4, and can walk with the vehicle, leaning the user's body on the upper frame 2, or leaning the user's hand on the upper frame 2. According to this, a user with disabled legs can walk or be 25 rehabilitated. Note that the seat plate portions 11p are positioned in the vertical state when the user walks using the vehicle. That is, when the user walks using the vehicle, the seat plate portions 11p are removed from an area (hereinafter referred to as leg moving area) 30 where the legs of the walking user move. According to this, the user can walk without being interrupted by the seat plate portions 11p. Further, when the user becomes 35

exhausted and wants to rest while the user walks using the vehicle, the seat plate portions 11p are pivoted so that the seat plate portions 11p project into the leg moving area and are positioned in the horizontal state. 5 In this way, the user can rest by sitting on the seat plate 11 formed by the seat plate portions 11p.

Further, when the user walks using the vehicle, the foot plates 12 are positioned in the vertical state. That is, the foot plates 12 are removed from the leg 10 moving area. According to this, the user can walk without being interrupted by the foot plates 12. When 15 the user rests, sitting on the seat plate 11, the foot plates 12 are projected into the leg moving area and positioned at the horizontal state. In this way, the user can rest, putting the user's feet on the foot plates 12.

Further, the vehicle of the invention has a function that a helper can move or carry a person. That is, in an emergency when it is necessary to move or carry a person 20 who cannot walk by the user (hereinafter referred to as person in need of help) to the destination, a person (hereinafter referred to as helper) who helps the person in need of help sits the person in need of help on the seat plate of the vehicle, and then pushes or pulls the vehicle to move the same to carry the person in need of help to the destination. 25

In the above explained vehicle, there is no object between the lower front ends of the horizontal portions of the connecting frame lower portions 41 which are 30 spaced from each other. In addition, the width between the horizontal portions of the connecting frame lower portions 41 is larger than that of a standard sitting type stool T (as shown by chain line in Figs.1 and 2; hereinafter only referred to as "stool"). Further, the 35 level of the front portion 3f of the lower frame horizontal portion 3h is higher than that of the seat of the standard stool T. According to this, when the user

enters into a restroom using the vehicle, the front portion of the lower frame horizontal portion 3h can pass over the seat of the stool T. In this way, the user can use the vehicle as a support in the restroom.

5 Further, in the above vehicle, the level of the seat plate portions 11p, when the seat plate portions 11 are projected into the leg moving area to come into a horizontal state, is higher than the level of the seat of the standard stool T. According to this, the seat plate portions 11p are maintained above the stool T. Further, as will be understood with reference to fig.3, a space is formed between the seat plate portions 11p when the seat plate portions 11p are projected into the leg moving area to come into the horizontal state. Therefore, the user 10 can use the vehicle, sitting on the seat plate 11 with the seat plate portions 11p being maintained above the stool T.

15 Of course, the seat plate 11 may be formed at a low level. In this case, the seat plate portions 11p may be mounted on an additional frame which extends parallel to the lower frame horizontal portion 3h and is connected to the lower frame vertical portions 3v and the vertical portion 4lv of the connecting frame lower portions 4l at the low area of the lower frame horizontal portion 3h, or 20 which is mounted on the lower frame horizontal portion 3h, depending thereon. According to this, the surface of the seat can be formed near the surface G of the floor.

25 Further, it is advantageous that the upper frame 2 can be easily replaced with an upper frame having a different shape. According to this, the upper frame 2 having the optimum shape can be selected, depending on the shape of the body of the user, and can be connected to the connecting frame 4, and then the user can use the vehicle.

30 Arrangements shown in Figs.4-11 can be employed as a seat plate having advantages similar to those explained above. In an embodiment shown in Fig.4, a pair of seat 35

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plate portions 11p is provided in front of the frame connecting portion between the lower frame 3 and the connecting frame 4 so that the seat plate portions 11p can pivot about the horizontal axis extending in the longitudinal direction. In an embodiment shown in Fig.5, two pairs of seat plate portions 11p are provided at the rear of the frame connecting portion so that the seat plate portions 11p can pivot about the horizontal axis extending in the longitudinal direction. In an embodiment shown in Fig.6, a pair of seat plate portions 11p is provided at the rear of the frame connecting portion so that the seat plate portions 11p can pivot about the horizontal axis extending in the longitudinal direction, but no space is formed between the seat plate portions 11p when the seat plate portions 11p are positioned to extend horizontally inwards. In an embodiment shown in Fig.7, a seat plate 11 is mounted on one of the horizontal portions of the lower frame 3 at the rear of the frame connecting portion so that the seat plate 11 can pivot about a horizontal axis extending in the longitudinal direction. In an embodiment shown in Fig.8, a pair of seat plate portions 11p is provided in front of the frame connecting portion and a pair of seat plate portions 11p is provided at the rear of the frame connecting portion so that the seat plate portions can pivot about a horizontal axis extending in the longitudinal direction.

In an embodiment shown in Fig.9, a pair of seat plate portions 11p is provided at the rear of the frame connecting portion, but the seat plate portions 11p are mounted on the horizontal portions of the lower frame 3 so that the seat plate portions 11p can pivot about a vertical axis v. In an embodiment shown in Fig.10, a pair of seat plate portions 11p is provided at the rear of the frame connecting portion and is fixed on the lower frame horizontal portion 3h and the lower frame horizontal portion 3h can pivot about a vertical axis v.

In an embodiment shown in Fig.11, a pair of seat plate portions 11p is provided in front of the frame connecting portion but the seat plate portions 11p are mounted on the lower frame horizontal portions 3h so that the seat plate portions 11p can pivot about a vertical axis v.

The handles 6 mounted on the upper frame lateral portions 2s are suitable for the user to grip when the user moves, facing rearwards, sitting on the seat plate 11. Further, the handles 6 may be formed so that the handles can pivot horizontally inwards about a horizontal axis as shown in Fig.12. According to this, the handles 6 are pivoted horizontally inwards and then the user can use the handles as a back support when the user rests on the seat plate 11.

Further, the seat plate portions 11p can be used as other than as the seat plate 11 for a rest. For example, the user sitting on the seat plate 11 can be rehabilitated by moving forwards with the user's legs. Further, the user can be rehabilitated by standing up from the seat plate 11 and sitting on the seat plate 11. Further, the seat plate 11 can be used as a handrail when a person lying down moves to the vehicle. Further, the user can move toward a sink using the vehicle, and after the user arrives at the sink, the user can sit on the seat plate 11 when the user washes dishes.

Further, back seat plates may be mounted on the rear edges of the seat plate portions 11a so that each back seat plate can pivot between the horizontal and vertical states. In this case, when the back seat plate is in the horizontal state, the back seat plate is on the upper wall face of the corresponding seat plate portion 11a, and on the other hand, when the back seat plate is in the vertical state, the back seat plate extends upwards from the rear edge of the corresponding seat plate portions 11a. When the back seat plates are in the vertical state, the back seat plates can be used as a back seat. Further, when the seat plate portions 11a are used as the

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5 seat plate 11 with the back seat plate in the horizontal state, the level of the seat surface where the user sits is higher than that of the seat surface when the seat plate portions 11a are used as the seat plate 11 with the back seat plate being in the vertical state.

Further, when a process for providing waterproof characteristics is applied to the entire of the vehicle, the vehicle of the invention can be used as a supporting device when the user takes a shower.

10 Further, aluminum can be used as a material for forming the frames, but the user of the vehicle leans the user's weight on the frames when the user walks, so the stability of the vehicle is high when the weight of the frames is relatively heavy, and therefore, in order to avoid a risk of user falling down, iron is preferable. Of course, any material for forming the frames can be employed depending on the necessity and, for example, the frames may be formed of a plastic material.

CLAIMS

5 1. A vehicle to assist walking having functions to help a person walk, and to allow a helper to move a person, wherein the vehicle comprises a frame extending around the body of the user of the vehicle to support the body of the user when the user walks using the vehicle,
10 wheels mounted on the frame, and a seat plate which can project from around the lateral side of the user to an area where the legs of the walking user move, and wherein the seat plate is removed from the area where the legs of
15 the walking user move when the user walks using the vehicle.

15 2. A vehicle to assist walking, as set forth in claim 1, wherein the seat plate can be pivoted about a predetermined axis, and wherein the seat plate is projected to the area where the legs of the walking user move by pivoting the seat plate.

20 3. A vehicle to assist walking, as set forth in claim 2, wherein the predetermined axis is a horizontal axis.

25 4. A vehicle to assist walking, as set forth in claim 1, wherein the seat plate comprises a pair of seat plate portions, and wherein the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move.

30 5. A vehicle to assist walking, as set forth in claim 1, wherein the seat plate can project from around the lateral and rear side of the user to the area where the legs of the walking user move.

35 6. A vehicle to assist walking, as set forth in claim 1, wherein the level of the lowest portion of the frame which is located in front of the user is higher than that of a seat of a stool, and wherein the width between the portions of the frame which is located around the lateral and front side of the user is larger than that of the stool.

7. A vehicle to assist walking, as set forth in

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claim 6, wherein the seat plate comprises a pair of seat plate portions, and wherein the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move, and wherein the level of the seat plate portions is higher than that of the seat of the stool and the seat plate portions form a space therebetween when the seat plate portions project to the area where the legs of the walking user move.

8. A vehicle to assist walking for assisting a person to walk, comprising a frame extending around the body of the user of the vehicle to support the body of the user when the user walks using the vehicle, and wheels mounted on the frame, and wherein the level of the lowest portion of the frame which is located in front of the user is higher than that of a seat of a stool, and wherein the width between the portions of the frame which is located around the lateral and front side of the user is larger than that of the stool.

9. A vehicle to assist walking, as set forth in claim 8, wherein the seat plate comprises a pair of seat plate portions, and wherein the seat plate portions can project from each lateral side of the user to the area where the legs of the walking user move, and wherein the level of the seat plate portions is higher than that of the seat of the stool and the seat plate portions form a space therebetween when the seat plate portions project to the area where the legs of the walking user move.

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ABSTRACT

A vehicle which has a function to help a person walk and a function that a helper can move a person, comprises
5 a frame (1) extending around a body of a user for supporting the body of the user when the user walks using the vehicle, wheels (7,9) mounted on the frame, and a seat plate (11) which can project from the generally lateral side of the user into an area where the legs of
10 the walking user move. The seat plate is withdrawn from the area where the legs of the walking user move when the user walks using the vehicle.

Fig.1

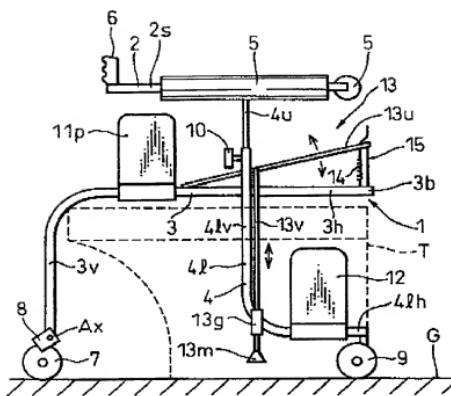


Fig.2

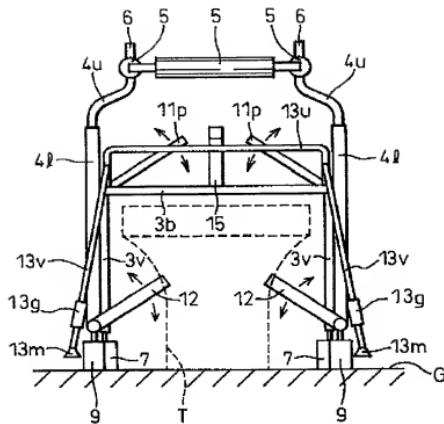


Fig.3

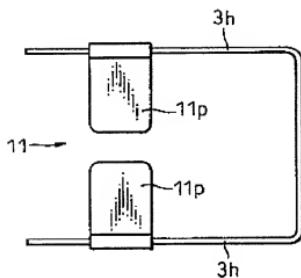


Fig.4

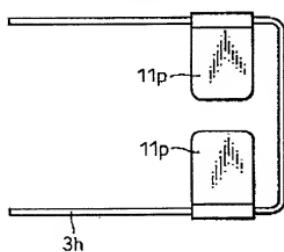


Fig.5

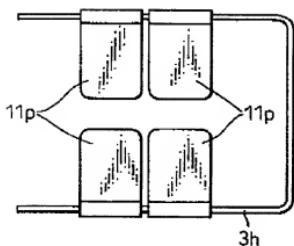


Fig.6

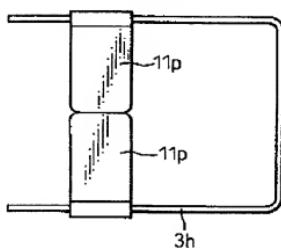


Fig.7

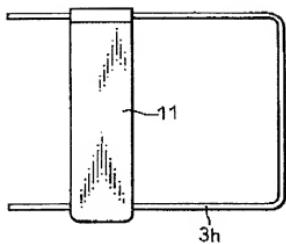


Fig.8

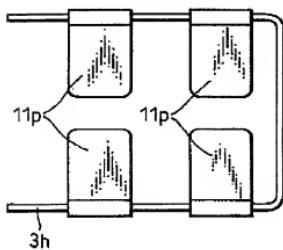


Fig.9

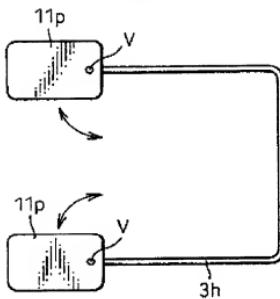
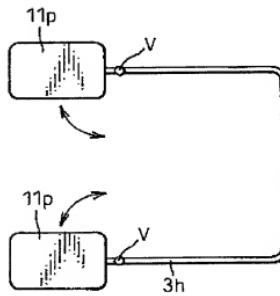


Fig.10



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Fig.11

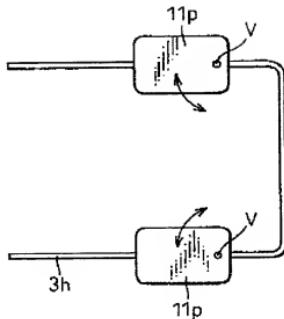
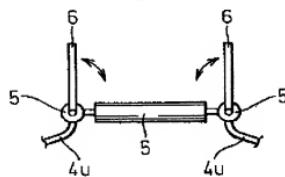


Fig.12



**DECLARATION AND POWER OF ATTORNEY
UNDER 35 USC §371(c)(4) FOR
PCT APPLICATION FOR UNITED STATES PATENT**

As a below named inventor, I hereby declare that:
my residence, post office address and citizenship are as stated below under my name;

I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought, namely the invention entitled: VEHICLE TO ASSIST WALKING
described and claimed in international application number PCT/JP00/03416 filed May 26, 2000.

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 35, Code of Federal Regulations §1.56.

Under Title 35, U.S. Code §119, the priority benefits of the following foreign application(s) filed by me or my legal representatives or assigns within one year prior to my international application are hereby claimed:

Japanese Patent Application No. 11-359648 filed November 13, 1999

Japanese Patent Application No. 2000-42019 filed January 13, 2000

The following application(s) for patent or inventor's certificate on this invention were filed in countries foreign to the United States of America either (a) more than one year prior to my international application, or (b) before the filing date of the above-named foreign priority application(s):

I hereby appoint the following as my attorneys of record with full power of substitution and revocation to prosecute this application and to transact all business in the Patent Office:

 James A. Olliff, Reg. No. 27,075; William P. Berridge, Reg. No. 30,024;
 Kirk M. Hudson, Reg. No. 27,562; Thomas J. Pardini, Reg. No. 30,411;
 Edward P. Walker, Reg. No. 31,450; Robert A. Miller, Reg. No. 32,771;
 Mario A. Costantino, Reg. No. 33,565; Stephen J. Roe, Reg. No. 34,463;
 Joel S. Armstrong, Reg. No. 36,430; Christopher W. Brown, Reg. No. 38,025; and
 Richard E. Rice, Reg. No. 31,560.

ALL CORRESPONDENCE IN CONNECTION WITH THIS APPLICATION SHOULD BE SENT TO OLIFF & BERRIDGE, PLC, P.O. BOX 19928, ALEXANDRIA, VIRGINIA 22320, TELEPHONE (703) 836-6400.

I hereby declare that I have reviewed and understand the contents of this Declaration, and that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1	<i>Typewritten Full Name of Sole or First Inventor</i>		Hiroko	Given Name	Middle Initial	SHIKINAMI	Family Name
2	Inventor's Signature		<i>1/tate</i>			<i>Shikinami</i>	
3	Date of Signature		August 14, 2001				
	Residence:	Kanazawa-shi	Month	Day	Year		
	Citizenship:	Japan	City	Ishikawa	Japan	Country	
	Post Office Address:	C/O NIPPON CLEAN ENGINE RESEARCH INSTITUTE CO., LTD. 1-33, Kitayasue 3-chome, Kanazawa-shi, Ishikawa 920-0022 Japan					
	(Insert complete mailing address, including country)						

Note to Inventor: Please sign name on line 2 exactly as it appears in line 1 and insert the actual date of signing on line 3.

IF THERE IS MORE THAN ONE INVENTOR USE PAGE 2 AND PLACE AN "X" HERE

1 *Typewritten Full Name
of Joint Inventor*

<i>D-W</i>	Given Name <u>Shigeru</u>	Middle Initial	ONISHI
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2 *Inventor's Signature:*

<i>Shigeru</i>	Family Name <u>Onishi</u>
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3 *Date of Signature:*

August 14, 2001			
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Residence:	Month <u>Kanazawa-shi</u>	Day <u>5</u>	Year <u>Ishikawa</u>
------------	------------------------------	-----------------	-------------------------

Citizenship:	City <u>Japan</u>	State or Province <u>Japan</u>	Country
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Post Office Address:	C/O NIPPON CLEAN ENGINE RESEARCH INSTITUTE CO., LTD.		
----------------------	--	--	--

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--	---	--	--

1 *Typewritten Full Name
of Joint Inventor*

Given Name	Middle Initial	Family Name
------------	----------------	-------------

2 *Inventor's Signature:*

<i>Shigeru</i>	Family Name <u>Onishi</u>
----------------	------------------------------

3 *Date of Signature:*

Month	Day	Year
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Residence:	City	State or Province	Country
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Citizenship:			
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Post Office Address:			
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(Insert complete mailing address, including country)			
--	--	--	--

1 *Typewritten Full Name
of Joint Inventor*

Given Name	Middle Initial	Family Name
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2 *Inventor's Signature:*

<i>Shigeru</i>	Family Name <u>Onishi</u>
----------------	------------------------------

3 *Date of Signature:*

Month	Day	Year
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Residence:	City	State or Province	Country
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Citizenship:			
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Post Office Address:			
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(Insert complete mailing address, including country)			
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1 *Typewritten Full Name
of Joint Inventor*

Given Name	Middle Initial	Family Name
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2 *Inventor's Signature:*

<i>Shigeru</i>	Family Name <u>Onishi</u>
----------------	------------------------------

3 *Date of Signature:*

Month	Day	Year
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Residence:	City	State or Province	Country
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Citizenship:			
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Post Office Address:			
----------------------	--	--	--

(Insert complete mailing address, including country)			
--	--	--	--

Note to Inventor: Please sign name on line 2 exactly as it appears in line 1 and insert the actual date of signing on line 3.

This form may be executed only when attached to the first page of the Declaration and Power of Attorney of the application to which it pertains.

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